OLQ Geological Services
Technical Memorandum
November 30, 1999

Oxygen Release Compound (ORC) Update

This memo is an update on the Geological Services evaluation and current position on ORC use. This memo supercedes any previous memo on this product.

Oxygen Release Compound (ORC) is a proprietary form of magnesium peroxide, sold by Regenesis Bioremediation Products (Regenesis). It releases oxygen slowly, to stimulate microorganisms. Research and field tests have shown that, applied correctly, ORC is successful in increasing the bioremediation of hydrocarbon contamination. Pertinent factors for ORC application include:

- ORC can not work in the presence of free product, which coats and seals the ORC.
- ORC works only in the presence of water, so will not help clean contamination in unsaturated soils.
- Field applications show the effective product life may be as short as three months, depending on site conditions. When using ORC, dissolved oxygen measurements must be made routinely, and ORC reinjected when levels approach background.
- ORC affects the area around the injection point, and a bit downgradient. The effects do not extend upgradient, or very far in a sidegradient direction. When injected on a grid pattern, points should not be over ten feet apart.
- ORC may not be cost-effective on high levels of contamination, because reinjections will be needed, and must be figured into the remediation cost.
- The most effective form of remediation is to inject a 40-60% ORC slurry into probe or bore holes in a grid pattern across the contaminant plume.
- Regenesis has a computer program to determine the amount of ORC needed, based on contaminant level. This should be followed, as under-application is the most common problem with unsuccessful applications.
- ORC should NOT be placed in monitoring wells, as this will prevent the well from being used for future monitoring. Also, as effects are limited to just around the injection point, a few well locations will not cover the entire plume.

This document is based on current information. It will be revised as additional data is acquired and evaluated.

- ORC is occasionally used as an “Oxygen barrier”. This is a misnomer and should be called a “treatment line”. ORC, injected in a line of bore holes, will form a temporary zone of higher dissolved oxygen. It will NOT form an actual barrier of any type, and must be replenished frequently to remain effective. Research has shown that contamination can break through even massive (and unrealistic) amounts of ORC (8" wells 3" apart with 120 lbs. per hole). If an actual barrier is needed, use a slurry or geotextile wall.

- ORC remediation is most suitable when combined with other methods, or used on small, well-defined hydrocarbon plumes with low to moderate levels of contamination.

- If contaminated groundwater is found in the pit when removing the tanks, it will help if ORC is added before backfilling, particularly if a low permeable layer is added on top of the ORC to prevent oxygen escape.

If you have any questions concerning ORC remediation, please contact Geological Services.